

Diagnostic Engineering Publications

1410/7010

IBM POUGHKEEPSIE
December 31, 1965

Subject: Diagnostic Program W002G 1403 Forms Control Test

Sequence Number 545
Replaces W002F

This program uses System and Channel Control Cards -

System Control Card	W002	001
Channel One Control Card	W002	002
Channel Two Control Card	W002	003
Channel Three Control Card	W002	004
Channel Four Control Card	W002	005

The following changes were made to W002F to create W002G -

1. All references to channel 3 & 4 operation were deleted.
2. An error in the set up of a 100 character print buffer for channel 2 was corrected.
3. Changes & corrections were made to the Print Error and Forms Control Error Routines.
4. Changes and corrections to the "Time High Speed Skip" routine to increase timing accuracy, check for lower limit as well as upper limit and reduce the upper limit to detect skip time failures on the 1403 model 3.

Enclosures: 48

Pages

Card Deck for CARD ONLY SYSTEMS (as punched by UP51)
8 Cards - Card Loader (1-7) and 1 Core Clear
115 Cards No. 001-115 Data Cards
1 Card Execute Card

Distribution: X 1410 with 1403 Printer
X 7010

W 0 0 2 G

1403 FORMS CONTROL TEST

12/31/64

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5.00.00.0 TEST DESCRIPTION

00.1 MODIFICATIONS

See Release Page for modifications to create this level.

00.2 DESCRIPTION

This diagnostic tests all possible forms control operations associated with a printed line such that a visual check for correctness can be made. High speed skip is also timed to insure that the carriage of the 1403 does enter a high speed skip on a skip of 29 lines.

The first sheet of the printed form will have a line of 100 nines, space 1 to 3 after print, space 1 to 3 immediate, skip 1 to 12 immediate and branch on channel 9 and 12. The second sheet of the form will have a line of 100 nines, space 1 to 3 after print, space 1 to 3 immediate, skip 1 to 12 after print, branch on channel 9 and 12, a test of the high speed skip, and (if applicable) a test of the space suppress feature.

Errors in spacing and skipping can be overlooked; therefore, it is suggested that the carriage tape be removed from the 1403 and compared carefully with the printed form. Sample printouts can be found in the appendix, section 5.00.07.0.

All error messages will occur on the typewriter because the numeric chain 1403 cannot print alphabetic information. Note also that the information printed during the test is entirely numeric and special characters when using a printer with a numeric chain (see appendix, section 5.00.07.0).

00.2 EQUIPMENT

1. 1414 Model III, IV or VIII.
2. 1403 Printer Model 1, 2, or 3 (with alpha or numeric chain).

00.4 CARD DECK

See bottom of Release Page for description of card deck.

00.5 E.C. LEVEL OF MACHINE

Not applicable.

5.00.01.0

LOADING PROCEDURES

01.1

FROM CARDS (Load Program L1A preceding Card Deck)

A. 1410 or 7010 without Load Button.

1. Display Memory Location 00000

2. Alter to

v v v

RL%1100011\$. Enter according to channel

vv v location of the card reader.

XL@1100011\$.

3. Set to Run, Computer Reset and Start.

B. 7010 with Load Button

1. Computer Reset

2. Depress Load Button

01.2

FROM TAPE

A. 1410 or 7010 without Load Button

1. Display Memory Location 00000

2. Alter to

v v v

RL%B000011\$. Enter according to channel

vv v location of the tape drive.

XL@B000011\$.

3. Set to Run, press Computer Reset.

B. 7010 with Load Button

1. Computer Reset

2. Depress Load Button

System and Channel control cards are used by this program. These cards must have the system and channel configuration in the proper columns of the cards before the program is loaded into core. (See listing of the program "1410/7010 INTRODUCTION vol 1.00, for punching information.)

5.00.01.3

LOADING PROCEDURES (continued)

A special printer carriage control tape must be used. It must be installed on the 1403 printer before the program is loaded into core. The tape should be punched as follows:

<u>Line</u>	<u>Channel</u>	<u>Line</u>	<u>Channel</u>
1	1	67	1
18	1	84	1
21	2	87	2
24	3	90	3
27	4	93	4
30	5	96	5
33	6	99	6
36	7	102	7
39	8	105	8
42	9	108	9
45	10	111	10
48	11	114	11
51	12	117	12
53	9	119	9
58	12	124	12

Cut off tape at line 132. Mount the tape in the 1403 and set the line spacing control for six lines per inch.

5.00.02.0

OPERATING PROCEDURES

For normal operation of the program no TADs or other information need be entered until the "REQ. SPACE SUPPRESS TAD" message occurs. At this time press Inquiry Request, enter a one to test space suppress or enter a blank to bypass space suppress test, and then press Inquiry Release.

If the program stops or hangs up during the pass, refer to section 5.00.04.0, Program Stops and Restarts, for information.

STANDARD TADs

TAD 0	Loc 01000	Off	1	Type all errors
		On	1	Bypass all error typeouts
TAD 1	Loc 01001	Off	1	Run complete program
		On	1	Loop in the same routine
TAD 2	Loc 01002	Off	1	Bypass all error halts
		On	1	Halt on all errors
TAD 3	Loc 01003	Off	1	One pass of program
		On	1	Repeat entire program

NOTE:

The "Program Alter Routine" is included in this test to allow the operator to alter any portion of the program, TADs, data fields, etc., with a minimum of effort at any time during the program pass. To use this routine press the 1415 INQUIRY REQUEST key and enter the five-digit address of the low order position of memory to be altered when the typewriter prints the letter "I" and spaces. After the address has been entered, press the Inquiry Release and the Inquiry Request again, the typewriter will again print an "I" and space. At this time the new information can be entered into memory. When the alterations are complete, press Inquiry Release and the program will resume the test.

If an error is made in typing in the address of core to be altered or the data, simply press Inquiry Cancel and press Inquiry Request once more.

5.00.03.0 OPERATING HINTS, COMMENTS

1. At the beginning of the test, the program identification will be typed. (If the program is repeated or restarted, the identification will not be retyped.) At the conclusion of the program pass a message, W002 EOJ, will be typed if tad 0 is Off. Therefore, a proper operation pass should appear on the console typewriter in the following format.

R W002X. where x represents test level.
R REQ SPACE SUPPRESS TAD
I 1
R W002 EOJ

2. If any messages occur other than listed in item 1., an error has been detected by the program.
3. If the message W002 EOJ does not occur, it is because either error timeouts have been bypassed (possibility of an error occurring which would not be indicated) or the program has not run to completion.
4. After a program pass, the 1403 output should be compared both with carriage tape and the sample printouts listed in the appendix section 5.00.07.0.
5. The 1403 output will be the same regardless of buffer size (100 or 132 characters).
6. If all of the following messages appear on a program pass; it indicates that the J (I) R (channel 1) instruction is not operating properly.

BRANCH ON CHANNEL 9 FAILED
BRANCH ON CHANNEL 12 FAILED
BRANCH ON CHANNEL 9 FAILED
BRANCH ON CHANNEL 12 FAILED
FORMS FAILED TO SKIP TO CHANNEL 12
1403 FAILED TO ENTER HIGH SPEED SKIP

5.00.04.0

PROGRAM STOPS AND RESTARTS

PROGRAM STOPS

This program does not contain any normal STOPs. All error STOPs are preceded by error messages and are under program (TAD) control. After any error stop, press Start to continue.

PROGRAM RESTARTS

A program restart may be accomplished at any time by simply pressing Computer Reset and Start.

PROGRAM HANG UP CONDITIONS

After the message "REQ SPACE SUPPRESS TAD" occurs, press typewriter INQUIRY REQUEST, enter the proper digit (1 or b) and then press INQUIRY RELEASE. The program will then continue.

Note: If a space or skip after print command is issued, a correct line must be printed before another forms control operation is attempted. If a restart is performed after a forms control operation (after print) and before the next line is printed, the program will hang up on busy.

5.08.05.0

TYPEOUTS


NORMAL TYPEOUTS

1. **W002x** (x represents test level). This is the test identification. The identification is typed only once when the program is first loaded.
2. **NO CHANNEL SET ON SYSTEM CONTROL CARD.** This message indicates that a channel was not available as punched on the systems control card.
3. **REQ SPACE SUPPRESS TAD.** This is a request for a space suppress control tad. Press Inquiry Request, enter proper tad (see section 5.08.02.0), and press Inquiry Release.
4. **W002 EOJ.** This typeout indicates the completion of one complete program pass.

ERROR TYPEOUTS

All error typeouts are self-explanatory. See the program listing for further information.

5.00.06.0 FLOW CHART



W002G

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5.00.07.0 APPENDIX

CORRECT 1403 OUTPUT

1. Figure I, sheets 1, 2, and 3 show the correct output on the 1403 printer with alpha chain and not entering a 1 for the Space Suppress TAD.
2. Figure II, sheet 1 shows page 3 of the correct output on the 1403 printer with alpha chain and entering a 1 for the Space Suppress TAD providing that your system does not have the Space Suppress Feature.

On systems with the space suppress feature, the last two lines of Figure II, sheet 1, should be superimposed upon one another so that it should appear as follows:

SPACE SUPPRESS PRINTER KKKKKK

WOOZ
014

SPACE 1 AFTER PRINT

SPACE 2 AFTER PRINT

SPACE 3 AFTER PRINT

SPACE 1 IMMEDIATE

SPACE 2 IMMEDIATE

SPACE 3 IMMEDIATE

SKIP TO CHANNEL 1 IMMEDIATE

SKIP TO CHANNEL 2 IMMEDIATE

SKIP TO CHANNEL 3 IMMEDIATE

SKIP TO CHANNEL + IMMEDIATE

SKIP TO CHANNEL 5 IMMEDIATE

SKIP TO CHANNEL 6 IMMEDIATE

SKIP TO CHANNEL ↗ IMMEDIATE

SKIP TO CHANNEL 8 IMMEDIATE

SKIP TO CHANNEL 9 IMMEDIATE

SKIP TO CHANNEL 10 IMMEDIATE

SKIP TO CHANNEL 11 IMMEDIATE

SKIP TO CHANNEL 12 IMMEDIATE

11.31 DRAVEN ON CHANNEL 97140

TEST BRANCH ON CHANNEL 12, 1403

SPACE 1 AFTER PRINT
SPACE 2 AFTER PRINT

SPACE 3 AFTER POINT

Figure I

Sheet 1.

SPACE 1 IMMEDIATE

SPACE 2 IMMEDIATE

SPACE 3 IMMEDIATE
SKIP TO CHANNEL 1 AFTER PRINT

Figure ~
Sheet 2

SKIP TO CHANNEL 2 AFTER PRINT

SKIP TO CHANNEL 3 AFTER PRINT

SKIP TO CHANNEL 4 AFTER PRINT

SKIP TO CHANNEL 5 AFTER PRINT

SKIP TO CHANNEL 6 AFTER PRINT

SKIP TO CHANNEL 7 AFTER PRINT

SKIP TO CHANNEL 8 AFTER PRINT

SKIP TO CHANNEL 9 AFTER PRINT

SKIP TO CHANNEL 10 AFTER PRINT

SKIP TO CHANNEL 11 AFTER PRINT

SKIP TO CHANNEL 12 AFTER PRINT

TEST BRANCH ON CHANNEL 9,1403

TEST BRANCH ON CHANNEL 12,1403

Figure I.
Sheet 3.

TEST HIGH SPEED SKIP 2 TO 12

HIGH SPEED SKIP O.K.

Figure II
Sheet 1.

TEST HIGH SPEED SKIP 2 TO 12

HIGH SPEED SKIP O.K.
SPACE SUPPRESS PRINTER ERROR
SPACE SUPPRESS PRINTER XXXXX

LOAD 37 LINES ORG 1000

STANDARD TADS

PROGRAM ALIEN ROUTINE

STANDARD TYPE ROUTINE

PR11265	SER	01086	G	01195	8
PR11268	SER	01093	G	01127	8
PR11272	SCNRG	01100	D	000000	000000
PR11273	SAR	01112	G	01148	A
PR11274	WCP	01119	H	210	00000
PR11275	WCP	01129	R	01119	2
PR11276	WCP	01136	R	01143	G
PR11277	WCP	01143	J	000000	
PR11278	WCP	01150			

OPCODE INSTRUCTION

LABEL	OPCODE	OPERAND	CONTROL INFORMATION	CT ADDRS
	ORG	1239		01239
	DCW	APM9PJO545#93		11 01249
	ORG	1250	TEST IDENTIFICATION	01250
	DCW	AM000260.G		5 01254

***** STANDARD SYSTEM CONTROL CARD. *****

	ORG	1256	CHARACTER & PURPOSE	COL	01256
SYS1	DC	a a	ALPHA 0,1,X - 1410,1410ACC,7010 13		1 01256
	DC	a a	0,1,3,5,7,9-10,20,40,60,80,100K 14		1 01257
E1	DC	a a	SPARE	15	1 01258
E2	DC	a a	1,2-CHNL1 100,132 CHAR PRINTER 16		1 01259
E3	DC	a a	1,2-CHNL2 100,132 CHAR PRINTER 17		1 01260
E4	DC	a a		2	01262
E5	DC	a a			1 01263
E6	DC	a a	1 - OVERLAP	20	1 01264
E7	DC	a a	1 - PRIORITY ALERT	21	1 01265
E8	DC	a a	SPARES	22-24	3 01267
E9	DC	a a		25	1 01268
E10	DC	a a	1 - CHANNEL ONE PRESENT	26	1 01269
E11	DC	a a	1 - CHANNEL TWO PRESENT		18 01287
E12	DC	a a	a NOT INTERROGATED		1 01288
E13	DC	a a			
	DC	a a			

***** STANDARD CHANNEL 1 CONTROL CARD. *****

	ORG	1289	CHARACTER & PURPOSE	COL
CHN1	DC	a	a P - 1403 PRINTER	29
	616	DC	a a A.N - ALPHA, NUMERIC PRINT CHAIN	30
	617	DC	a a 1.2 - 100,132 CHAR PRINT BUFFER	31
	618	DC	a a a NOT INTERROGATED	16
	DC	a	a NOT INTERROGATED	18
	DC	a	a	18
	DC	a	a a	2

***** STANDARD CHANNEL 2 CONTROL CARD. *****

	ORG	1346	CHARACTER & PURPOSE	COL
CHN2	DC	a	a P - 1403 PRINTER	29
	616	DC	a a A.N - ALPHA, NUMERIC PRINT CHAIN	30
	617	DC	a a 1.2 - 100,132 CHAR PRINT BUFFER	31
	618	DC	a a a NOT INTERROGATED	16
	DC	a	a	18
	DC	a	a a	2

TEST STARTS HERE

ORG	2000		02000	
NOP			1 02000	N
SWI	B	INID	7 02001	J 06057
CW	SW1		6 02006	B 02031
CS	99		6 02014	/ 00099
MRCWG RSTART.1				
SH	30.35	SET	12 02020	D 07025 00001 0
SH	40.45	INDEX	11 02032	- 00030 00035
S	49	REGS	11 02043	, 00040 00045
S		2	6 02054	S 00049
S		THRU	1 02060	S
S		5	1 02061	S
S			1 02062	S
S			6 02063	S 06955
CHSV				
MLNA	ADD1,STARAD	SET CHAN ALTER START	12 02069	D 06950 06936 /
MLNA	ADD2,STOPAD	SET CHAN ALTER STOP	12 02081	D 06965 06941 /
BCE	CHAN1,SYSL12,1	BR IF CHAN 1 AVAIL	12 02093	B 02214 01268 1
BCE	CHAN2,SYSL13,1	BR IF CHAN 2 AVAIL	12 02105	B 02426 01269 1
BCE	END,CHSV,1	BR IF CHAN WAS AVAIL	12 02117	B 06168 06955 1
B	PRT1		7 02129	J 01066
DCH	a NO CHANNEL SET ON SYS CTL CDA,G		29 02164	
RCP	SYS1E12	READ TO SET CHAN	10 02166	H 210 01268 R
BEX1	*-16,M		7 02176	R 02166 H
G	BA1	*61	7 02183	R 02190 H
G	B	2000	7 02190	J 02000
G	DCW	AN	17 02213	a FILLER

W002 - PRINTER FORMS CONTROL TEST
OPCODE OPERAND

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CT ADDRS INSTRUCTION

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION	
CHAN1	SBR	CHAN&5	7	02214	G 06166 B	
	BCE	*C8.CHN1616.P	12	02221	B 02240 01303 P	
B		CHANR	7	02233	J 06161	
MLCS	ONE,CHSW	SET CHAN AVAIL	12	02240	D 07034 06955 3	
S	X2	RESET X2	6	02252	S 00034	
	NOP		1	02258	N	
BCE	*E20,CHN1617.N	BR IF NUMERIC CHAIN	12	02259	B 02290 01306 N	
MLCA	ALPH,CHAIN		12	02271	D 06972 06971 T	
B	*E13		7	02283	J 02302	
MLCA	NUM,CHAIN		12	02290	D 06973 06971 T	
BCE	AAA1,CHN1618,1	BR IF 100 CHAR BUFF	12	02302	B 02345 01307 1	
MLCWS	ABCDE6,POUT6100	MOVE A BLANK	12	02314	D 02344 09800 7	
MLCS	TWO,SIZE		12	02326	D 07035 06954 3	
B	AAA2		7	02338	J 02369	
ABCD			12	02345	D 07034 06954 3	
AAA1	MLCS	ONE,SIZE	12	02357	D 07033 09800 7	
	MLCWS	WMGM,POUT&100	12	02369	D 07034 06942 3	
AAA2	MLCS	ONE,BOLOM	12	02381	D 06946 06944 3	
	MLCS	CHIU,CHCODE	SET Z TO CHAN ALTER	12	02393	D 06950 06943 3
	MLCS	CHIS,CHSTAT	SET R TO CHAN ALTER	7	02405	J 06216
B	CHSTT	GO TO ALTER PROGRAM	7	02412	J 04233	
B	TITLE	PRINT LINE OF 9 S	7	02419	J 03062	
B	START	GO TO START PRINTER				

CT ADDRS INSTRUCTION

LABEL OPERAND

CHAN2	SBR	CHANRES	7	02426	G 06166 B
	BCE	*E8,CHN2E16,P	12	02433	B 02452 01362 P
	B	CHANR	7	02445	J 06161
	MLCS	ONE,CHSV	12	02452	D 07034 06955 3
	S	X2	6	02464	S 00034
	NOP		1	02470	N
	BCE	*E20,CHN2E17.N	12	02471	B 02502 01363 N
	MLCA	ALPH,CHAIN	12	02483	D 06972 06971 T
	B	*E13	7	02495	J 02514
	MLCA	NUM,CHAIN	12	02502	D 06973 06971 T
	BCE	AAA3,CHN2E18.1	12	02514	B 02557 01364 1
G	MLCHS	ABCD66,POUT&100	12	02526	D 02344 09800 7
	MLCS	TWO,SIZE	12	02538	D 07035 06954 3
	B	AAA4	7	02550	J 02581
	MLCS	ONE,SIZE	12	02557	D 07034 06954 3
	MLCHS	WNGM,POUT&100	12	02569	D 07033 09800 7
	MLCS	TWO,BOL0M	12	02581	D 07035 06942 3
	MLCS	CH2U,CHCODE	12	02593	D 06947 06944 3
	MLCS	CH2S,CHSTAT	12	02605	D 06951 06943 3
	B	CHSTT	7	02617	J 06216
	B	TITLE	7	02624	J 04233
	B	START	7	02631	J 03062
G	H		1	02638	
	ORG	3062	03062		
		PRINT LINE OF 9 S	7		

LABEL OPCOD OPERAND

SPACE AFTER PRINT ROUTINE

START	S X3	RESET X3 TO ZERO	6 03062 S 00039
	CS POUT&50	CLEAR PRINT AREA	6 03068 / 09750
	BCE *13,CHAIN,A	BR IF ALPHA CHAIN	12 03074 B 03098 06971 A
	MLNA ADD4,X3	MOVE NUMERIC ADDR.	12 03086 D 06970 00039 /
	MLCHS WMGM,POUT&132	SET WMGM FOR 132	12 03098 D 07033 09832 7
	BCE *13,SIZE,2	BR IF 132 CHAR	12 03110 B 03134 06954 2
	MLCHS WMGM,POUT&100	SET WMGM FOR 100	12 03122 D 07033 09800 7
	MRCG MESS1&X3,POUT	MOVE SPACE 1 AFTER	12 03134 D 070H2 09700 S
	CC /	SPACE 1 AFTER	2 03146 F /
	BCB1 *-8		7 03148 R 03146 2
	BA1 FORER		7 03155 R 05045 H
	BNQ PALT		7 03162 J 01035 Q
	BCE SPA1,TAD1,1	BR IF LOOP	12 03169 B 03146 01001 I
	W POUT	PRINT SPACE 1 AFTER	10 03181 H 220 09700 W
	BCB1 *-16		7 03191 R 03181 2
	BA1 PERR		7 03198 R 05531 H
	BNQ PALT		7 03205 J 01005 Q
	BCE WRI,TAD1,1	BR IF LOOP	12 03212 B 03181 01001 I
	CS POUT&50	CLEAR PRINT AREA	6 03224 / 09750
	MRCG MESS3&X3,POUT	MOVE SPACE 2 AFTER	12 03230 D 07143 09700 S
	CC S		2 03242 F S
	SPA2 BCB1 *-8		7 03244 R 03242 2
	BA1 FORER		7 03251 R 05045 H
	BNQ PALT		7 03258 J 01035 Q
	BCE SPA2,TAD1,1	BR IF LOOP	12 03265 B 03242 01001 I
	W POUT	PRINT SPACE 2 AFTER	10 03277 H 220 09700 W
	BCB1 *-16		7 03287 R 03277 2
	BA1 PERR		7 03294 R 05531 H
	BNQ PALT		7 03301 J 01035 Q
	BCE WR2,TAD1,1	BR IF LOOP	12 03308 B 03277 01001 I

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION	
	CS	POUT650			CLEAR PRINT AREA	
	MRCC	MESS4EX3,POUT			MOVE SPACE 3 AFTER	
SPA3	CC	1	6	03320	/ 09750	
	BCB1	•-8	12	03326	D 071B4 09700 S	
	BA1	FORER	2	03338	F T	
	BNQ	PALT	7	03340	R 03338 2 G	
	BCE	SPA3,TADI,1	7	03347	R 05045 H	
		BR IF LOOP	7	03354	J 01005 Q	
			12	03361	B 03338 01001 I	
			10	03373	H 320 09700 W	
				7	03383	R 03373 2 G
				7	03390	R 05531 H
				7	03397	J 01005 Q
				12	03404	B 03373 01001 I
					PRINT SPACE 3 AFTER	
WR3	W	POUT				
	BCB1	•-16				
	BA1	PERR				
	BNQ	PALT				
	BCE	WR3,TADI,1				
		BR IF LOOP				

W002 - PRINTER FOR MS CONTROL TEST
OPCODE OPERAND
LABEL

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CT ADDRS INSTRUCTION

SPACE IMMEDIATE ROUTINE

CS POUT650 MESS66X3,POUT
MRCG
SP11 CC J MOVE SPACE 1 IMED.
BCB1 *-8
BA1 FORER
BNQ PALT
BCE SPI1,TAD1,1 BR IF LOOP
WR4 W POUT
BCB1 *-16
BA1 PERR
BNQ PALT
BCE WR4,TAD1,1 BR IF LOOP
PRINT SPACE 1 IMED.
WR4
BCB1 *-16
BA1 FORER
BNQ PALT
BCE SPI1,TAD1,1 BR IF LOOP
CLEAR PRINT AREA
MOVE SPACE 2 IMED.
SP12 CC K
BCB1 *-8
BA1 FORER
BNQ PALT
BCE SPI2,TAD1,1 BR IF LOOP
PRINT SPACE 2 IMED.
WRS W POUT
BCB1 *-16
BA1 PERR
BNQ PALT
BCE WR5,TAD1,1 BR IF LOOP
6 03416 / 09750
12 03422 D 07105 09700 S
2 03434 F J
7 03436 R 03434 G
7 03443 R 05045 H
7 03450 J 01005 Q
12 03457 B 03434 01001 I
10 03469 M 220 09700 W
7 03479 R 03469 G
7 03486 R 05531 H
7 03493 J 01005 Q
12 03500 B 03469 01001 I
6 03512 / 09750
12 03518 D 071F6 09700 S
2 03530 F K
7 03532 R 03530 2
7 03539 R 05045 H
7 03546 J 01005 Q
12 03553 B 03530 01001 I
10 03565 M 220 09700 W
7 03575 R 03565 2
7 03582 R 05531 H
7 03589 J 01005 Q
12 03596 B 03565 01001 I

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CLEAR PRINT AREA
MOVE SPACE 3 IMMED.
WRCG  MESS1EX3,POUT
SP13  *-8
BCB1  *-16
B11  PERR
B12  PALT
BCE  SP13,TAD1,1
OR IF LOOP
PRINT SPACE 3 IMMED.
WRCG  POUT
BCB1  *-16
B11  PERR
B12  PALT
BCE  WR6,TAD1,1
OR IF LOOP
GO TO SKIP IMMED.OR AFTER
FSP1  *-81

```

ROUTINE MEDICINE

12 03711 0 06988 03709 /
 6 03723 S 00049
 1 03729 S
 12 03730 D 07434 03773 3
 6 03742 / 09750
 12 03748 D 07248 09700 4
 12 03760 D 07477 09718 1
 2 03772 F 1
 7 03774 R 03772 2
 7 03781 R 05045 H
 10 03788 H 320 09700 H
 7 03798 R 03788 2
 7 03805 R 05531 H
 7 03812 J 01005 Q
 12 03819 B 03772 01001 1
 11 03831 A 07035 00049
 1 03842 A
 12 03843 B 03862 03773 2
 7 03855 J 03730

 ALTER BRANCH ADDRESS
 RESET X4
 AND X5
 MOVE SKIP MODIFIER
 CLEAR PRINT AREA
 MOVE MESSAGE
 CHAN NO. TO PRINT
 SKIP IMMED.
 CC 1
 BC81 8-8
 8A1 FORER
 H POUT
 PRINT SKIP IMMED. X
 BC81 8-16
 8A1 PERR
 BNQ PALT
 BCE SKI,TA01,1
 A TWO,X5
 BR IF LOOP
 ADD 2 TO X5
 ADD 1 TO X4
 OR IF SKIPPED 1-12.
 SR IF NOT
 BCE BCH912,SKI61,2
 SR IF NOT
 SKIR

BRANCH ON CHANNEL 9 AND 12

```

BCH912 CS POUT&99          6 03862 / 09799
      BNQ PAUT             7 03868 J 01005 Q
      SKIP9 CC 9             2 03875 F 9
                                SKIP TO 9 IMMED.

      BCBL *-8
      BAI FORER
      BPCB *-6
      BC9 CH90K
      BCE CH9H,TAD0,1
      B PRT1
      DCW ABRANCH ON CHANNEL 9 FAILED, G
      BCE *E2,TAD02, BR IF BYPASS HALT
      H

      CH9H
      BNQ PAUT
      BCE BC912,TAD1,1
                                BR IF LOOP

      WR7 MESS9&X3,POUT
      W POUT
      BC81 *-16
      BAI PERR
      BNQ PAUT
      BCE WR7,TAD1,1
                                BR IF LOOP

      SKIP12 CC 3
      BC81 *-8
      BAI FORER
      BPCB *-6
      BCV CH120K
      BCE CH12H,TAD0,1
      B PRT1
      DCW ABRANCH ON CHANNEL 12 FAILED, G
      BCE *E2,TAD02, BR IF BYPASS HALT
      H

      CH12H
      BNQ PAUT
      BCE SKIP12,TAD1,1
                                BR IF LOOP

```

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CT ADDRS INSTRUCTION

CS POUTC99 CLEAR PRINT AREA
NRCC MESS10C93,POUT MOVE CHAN 12 BR MESS
POUT PRINT BR ON CHAN 12
W MRE 0-16 12 04153 D 07262 09700 8
SC81 0-16 10 06165 H 220 09700 H
BA1 PERR 7 04165 R 04165 2
BA1 PERR 7 04182 R 05531 H
BA1 PERR 7 04189 J 01055 0
BA1 PERR 12 04196 B 04169 01091 1
C FSP103,ADD6 SEE IF PAGE 2
SU TITLE BR IF NOT
0 TIMES GO TO TIME HIGH SPO

CS POUTC99 CLEAR PRINT AREA
POUT SET MN TO STOP MOVE
SC81 MINE,POUTC99 MOVE A MINE
MLC8 POUTC99,POUTC98 MOVE 99 MORE
MLC8 POUTC99,POUTC98 MOVE 99 MORE
POUT PRINT LINE OF MINES
SC81 0-16 10 04269 H 220 09700 H
BA1 PERR 7 04279 R 04269 2
CS POUTC99 6 04293 / 09799
CS POUTC99 7 04299 J 03062
CS START 7 04299 J 03062
CS GO TO 00 NEXT PAGE

* SKIP AFTER PRINT

```

* SKIP AFTER PRINT

  SKIPA  MLNA  ADD06,FSPIES
        S    X5
        S
  SKAR  MLCS  AND05X4,SKA61
        CS   POUT650
        MRCG  MESS11EX3,POUT
        MLCA  MOD5EX5,POUT618
        CC   A
        BC81  *-8
        BAI  FORER
        W    POUT
        BC81  *-16
        BAI  PERR
        BNQ  PALT
        BCE  SKA,TADI,1
        BR  IF LOOP

  TWO,X5
  ADD 2 TO X5
  ADD 1 TO X4
  BCE  BCH912,SKA61,B
  BR  IF SKIPPED TO 12
  B   SKAR  BR  IF NOT

  12  04306  D 06993 03709 /
        6  04318  S  00049
        1  04324  S
  MOVE SKIP MODIFIER
  CLEAR PRINT AREA
  MOVE SKIP AFTER X MESSAGE
  MOVE CHAN NO. TO PRINT
  SET SKIP AFTER
  10  04369  R  04367 2
  7  04376  R  05045 H
  PRINT SKIP AFTER MESS
  10  04383  H  320 09700 H
  7  04393  R  04383 2
  7  04400  R  05531 H
  7  04407  J  01005 Q
  12  04414  B  04367 01001 1
  11  04426  A  07035 00049
  1  04437  A
  12  04438  B  03862 04368 0
  7  04450  J  04325

```

TIME HIGH SPEED SKIP

TIME	S	ACCUM	RESET TIME ACCUM.	6. 04457 S 06999 G
BA1	*61			7 04463 R 04470 H
CC	2		SKIP IMMED. TO 2	2 04470 F 2
BCB1	*-8			7 04472 R 04470 2
BA1	FORER			7 04479 R 05045 H
CS	POUT650			6 04486 / 09750
MRCC	MESS126X3,POUT		MOVE TEST HIGH SPEED	12 04492 D 073C6 09700 S
W	POUT		PRINT MESSAGE	10 04504 H 220 09700 W
BCB1	*-16			7 04514 R 04534 2
BA1	PERR			7 04521 R 05531 H
MLCA	TIMX,TIMC		MOVE 7010 TIME CONST.	12 04528 D 07008 07017 T
BCE	*C37,SYSL,X		BR IF 7010	12 04540 B 04588 01256 X
MLCA	TIM10,TIMC		MOVE 1410 TIME CONST.	12 04552 D 07014 07017 T
BCE	*C13,SYSL,O		BR IF	12 04564 B 04588 01256 O
MLCA	TIM1,TIMC		MOVE 1410 ACCELERATOR	12 04576 D 07011 07017 T
S	ACCUM			6 04588 S 06999
BPCB	*-6		WAIT FOR NOT BUSY	7 04594 J 04594 R
CC	a		SKIP IMMED. TO 12	2 04601 F a
BCB1	*-8			7 04603 R 04601 2
G	A	TIMC,ACCUM	ADD LOOP TIME TO ACCUMULATOR	11 04610 A 07017 06999
G	BPCB	*-17	KEEP ADDING WHILE CARRIAGE BUSY	7 04621 J 04610 R
BA1	*61			7 04628 R 04635 H
G	BCV	CKTIME	CHECK ON TIME ACCUMULATED	7 04635 J 04712 a
BCE	HS12H,TADO,1		BR IF BYPASS ERROR	12 04642 B 04734 01000 1
B	PRT1			7 04654 J 01086
G	DCW	a FAILED TO SKIP TO CHANNEL 12a,G		29 04689
G	DCW	aN a		1 04691
BCE	*C2,TAD2,	BR IF BYPASS HALT		12 04692 B 04735 01002
HS12H	H			1 04704
BHQ	PALT			7 04705 J 01005 0

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CKTIME	G	C	ACCUM, ZEROS	BE SURE ACCUMULATOR NOT ZERO	11	04712	C 06999 05289
G	BE	*E19	IF SO IT FAILED	7	04723	J 04748 S	
G	C	ACCUM, TOTAL	COMPARE TO 180 MILLISECS	11	04730	C 06999 01005	
G	BH	HSOK	TOOK LESS THAN 180 MILLISECS	7	04741	J 04832 U	
BCE	HSFH, TADO, 1	BR IF BYPASS ERRORS	12	04748	S 04835 01000 1		
B	PRT1			7	04760	J 01086	
DCW	2 1403	FAILED TO ENTER A		21	04787		
DC	a HIGH SPEED SKIP, G			16	04803		
BCE	DC	2 1403 FAILED TO ENTER A		12	04805	S 04818 01002	
H	BNQ	PA1T		1	04817	.	
B	SSUP			7	04825	J 01035 Q	
HSOK	CS	POUT650		6	04832	/ 09750	
WR9	W	MESS133X3, POUT		12	04838	D 073F8 09700 S	
	POUT			10	04850	H 220 09700 W	
	BC81	*-16		7	04860	R 04850 2	
BA1	PERR			7	04867	R 05531 H	
BNQ	PA1T			7	04874	J 01005 Q	
G	BCE	TIMES, TAD1, 1	BR BACK IF LOOP TWO SET TO 1	12	04881	S 04457 01001 1	
B	SSUP			7	04893	J 06095	

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CT ADDRS INSTRUCTION

SPACE SUPPRESS ROUTINE

SPSUP SBR SPSUPRES
CS POUT650
MRCG MESS14EX3,POUT
W POUT
BCB1 *-16
BA1 PERR
CC -
BCB1 *-8
BAL FORER
CS POUT650
MRCG MESS15EX3,POUT
W POUT
BCB1 *-16
BA1 PERR
BNQ PALT
BCE SPSUP&7,TAD1,1
MLCS 9999,SST
SPSUPR B 0
7 04900 G 05043 B
6 04907 / 09750
12 04913 D 07440 09700 S
10 04925 H 220 09700 W
7 04935 R 06925 2
7 04942 R 05531 G
2 04949 F -
7 04951 R 04949 2
7 04958 R 05045 G
6 04965 / 09750
12 04971 D 07452 09700 S
10 04983 H 220 09700 W
7 04993 R 04983 2
7 05000 R 05531 H
7 05007 J 01035 Q
12 05014 B 04937 01001 1
12 05026 D 09999 07016 3
7 05038 J 00000 .

FORMS CONTROL ERROR ROUTINE

FORER	FORERR5	G	05240	B
SBR	MOVE15	G	05075	B
SBR	615,MOVE15	S	09606	05075
S	0,FMESSE9	D	00000	05159 1
MOVE1	MLCA	G	07023	A
SAR	LOC	G	07023	A
A	81,LOC	G	09607	07023
MLNA	LOC,FMESSE20	G	07023	/
8	TIND1	G	05112	05936
G	MLCB	WKAL,STIND	05119	D 06983 05185 L
BCE	FHALT,TAD0,1	12	05131	B 05222 01000 1
B	PRT1	7	05143	J 01086
FMESSE	DCW	a INSTR. LOC.	22	05150
G	DCW	a IND SET a	9	05180
STIND	G	a INSTR. LOC.	5	05185
G	DCW	NRDY,WKAL-4,1	12	05187 B 05242 06979 1
G	DCW	aN	8	05206
G	DCW	aN	15	05221
FHALT	BCE	*62,TAD2,	12	05222 B 05235 01002
H	B	H	1	05234 .
FORERR	B	0	7	05235 J 00000
NRDY	B	PRT1	7	05242 J 01086
DCW	DCW	a 1403 NOT READY a, G	15	05263
MLNA	LOC,•66	LOC,•66	12	05265 D 07023 05282 /
H	H	0	6	05277 . 00000
G	H	0	1	05283 .
ZEROS	G	DCW	6	05289
ORG	5531			

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LABEL

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CT ADDRS INSTRUCTION

PRINT ERROR-ERROR ROUTINE

PERR SBR PERREX65
SBR MOVEP65
S 615,MOVEP65
MOVEP HLCA 0,PHMESS617
SAR LOC
LOC
A 61,LOC
MLNA LOC,PHMESS28
TIND1
B PHALT,TADO,1
BCE PRT1
B
PHMESS DCW 2 INSTR.
BCE NRDY,WKA1-4,1
BCE PDCK,WKA1-3,4
BCE PCOND,WKA1-2,8
BCE PWLR,WKA1,B
BCE PNT,WKA1-1,A
BCE *62,TAD2,
PHALT BCE H
PERREX B 0
7 05531 G 05732 B
7 05538 G 05561 B
11 05545 S 09606 05561
12 05556 D 00000 05641 T
7 05568 G 07023 A
11 05575 A 09607 07023
12 05586 D 07023 05652 /
7 05598 J 05936
12 05605 B 05714 01000 1
7 05617 J 01086
29 05624
12 05654 B 05242 06979 1.
12 05666 B 05734 06980 4
12 05678 B 05782 06981 8
12 05690 B 05857 06983 B
12 05702 B 05897 06982 A
12 05714 B 05727 01002
1 05726
7 05727 J 00000

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LABEL	OPCODE	OPERAND	CT ADDRS	INSTRUCTION
P0CK	B	PRT1	7	05734 J 01086
	DCW	a CPU TO 1414 III DATA XFER ERROR a.G	33	05773
	B	PHALT	7	05775 J 05714

PCOND G MLCB POUT&30.LINESS SET MESSGE IN TYPEOUT AREA

B	PRT1	12	05782 D 09730 05836 L
C	DCW a S/B a	7	05794 J 01086
	a	5	05805
LINESSG	G	31	05836
	DCW aN	12	05849
B	PHALT	7	05850 J 05714
PMLR	B	7	05857 J 01086
	PRT1	25	05888
	DCW a 1403 WRONG LENGTH RECORD a.G	7	05890 J 05714
	B		
PNT	B	7	05897 J 01086
	PRT1	23	05926
	DCW a 1403 NO TRANSFER ERROR a.G	7	05928 J 05714
	B	1	05935
	H		

STATUS INDICATOR TEST ROUTINE

TIND1	SBR TINDIRE5	7	05936 G 06055 B
MLCA	INDS, WKAL1	12	05943 D 06978 06983 T
BNR1	*613	7	05955 R 05974 L
MLCS	9999, WKAL-4	12	05962 D 09999 06979 3
BER1	*613	7	05974 R 05993 4
MLCS	9999, WKAL-3	12	05981 D 09999 06980 3
BEF1	*613	7	05993 R 06012 8
MLCS	9999, WKAL-2	12	06000 D 09999 06981 3
BNT1	*613	7	06012 R 06031 B
MLCS	9999, WKAL-1	12	06019 D 09999 06982 3
BNT1	*613	7	06031 R 06050 -
MLCS	9999, WKAL	12	06038 D 09999 06983 3
TIND1	B 0	7	06050 J 00000

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CT ADDRS INSTRUCTION

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* * COME HERE TO TYPE IDENT

IND10	SBR	IND10	IND10
BA1	*E1	BA1	1250
WCP	1250	BA1	*-16
IND10	B	0	

TYPE IDENT.

* * SPACE SUPPRESS ROUTINE

SSUP	B	PRT1	
		AREQ,SPACE SUPPRESS TADA,G	
DCW			
RCP	SST		
BEX1	*-16,M		
BA1	*E1		
BCE	SPSUP,SST,1		
		CHANR	
		B	0

GO TO TEST NEXT CHAN

7	06057	G	06093	B
7	06064	R	06071	G
10	06071	M	ZTO 01250	W
7	06081	R	06071	G
7	06088	J	00000	
7	06095	J	01086	
22	06123			
10	06125	M	ZTO 07018	R
7	06135	R	06125	S
7	06142	R	06149	H
12	06149	B	04900	07018
7	06161	J	00000	
12	06168	B	02000	01003
12	06180	B	00400	01000
7	06192	J	01086	
9	06207			
7	06209	J	00400	

CHANNEL ALTER ROUTINE

CHSTR	CHSTR65
SBR	STARAD, SCANGE10
MLNA	
SW	25
S	29
A	61,29
SCNLB	9999,0
SBR	ADDHL0
A	ONE,ADDHL0
C	ADDHL0,STOPAD
BE	CHSTR
MLNA	ADDHL0,*66
MLCS	0,*612
BCE	CHINS,K1,M
BCE	STINS
BCE	
UPDATE	S
MLNA	ADDHL0,SCANGE11
B	SCAN
MLNA	ADDHL0,*611
MLCS	CHCODE,0EX1
B	UPDATE
MLNA	ADDHL0,*611
MLCS	CHSTAT,0
C	UPDATE
MLNA	ADDHL0,*66
MLCS	CHCODE,0EX1
A	UPDATE
MLNA	ADDHL0,*66
MLCS	CHCODE,0EX1
OLINS	OLINS

Project Address Instruction Operando

CS 0.*E12 0L,K2,1
CE 06482 D 00000 06505 3
CE 06494 B 06535 06926 1
CE 06506 B
CE 06507 B
CE 06508 B
CE 06509 B 06593
CE 06515 B
CE 06516 B 06815
CE 06522 B
CE 06523 B 06667
CE 06529 B
CE 06530 B 06741
CE 06536 B
CE 06537 S 09608 06931
CE 06548 J 06367
CE 06555 D 06931 06577 /
CE 06567 D 06942 00000 3
CE 06579 J 06537
CE 06586 J 00000
CE 06593 B 06636 06942 2
CE 06605 D 06931 06627 /
CE 06617 D 06922 00000 3
CE 06629 J 06537
CE 06636 D 06931 06658 /
CE 06648 D 06921 00000 3
CE 06660 J 06537
CE 06667 B 06710 06942 2
CE 06679 D 06931 06701 /
CE 06691 D 06918 00000 3
CE 06703 J 06537
CE 06710 D 06931 06732 /
CE 06722 D 06917 00000 3
CE 06734 J 06537
CE 06741 B 06784 06942 2
CE 06753 D 06931 06775 /
CE 06765 D 06916 00000 3
CE 06777 J 06537

• PROGRAM CONSTANTS

CH1U	DCW	aXA	1 06946
CH2U	G	aXA	1 06947
		00	2 06949
CH1S	G	aRA	1 06950
CH2S	G	aXA	1 06951
		00	2 06953
SIZE		0	1 06954
CHSY		0	1 06955
ADD1		TINDIR	5 06960 06050
ADD2		START	5 06965 03062
ADD4		00382	5 06970
CHAIN		0	1 06971
ALPH		aAA	1 06972
NUM		aNA	1 06973
INDS		a148ABA	5 06978
WK11		a	5 06983
ADD5		SKIPA	5 06988 04306
ADD6		SKIP1	5 06993 03711
ACCUM		000000	6 06999
TOTAL	G	180000	6 07005
TIMX	G	042	3 07008
TIME	G	121	3 07011
TIME10	G	149	3 07014
TIMEC		000	3 07017
SST		a a	1 07018
LOC		00000	5 07023
ORER		0	1 07024
RSTART		aJ020000 a.G	7 07025
WMGM		aNA	1 07033
ONE		1	1 07034
TWO		2	1 07035
THREE		3	1 07036
FOUR		4	1 07037
FIVE		5	1 07038

	MODS	AMODS
SIX		
SEVEN		
EIGHT		
NINE	0	
ZERO	000	
6	333	3AA
7	313	38A
8	323	3CA
9	333	31A
0	343	311A
	353	312A
	363	310A
	373	300A
	383	301A
	393	302A
	403	303A
	413	304A
	423	305A
	433	306A
	443	307A
	453	308A
	463	309A
	473	3000A
	483	3001A
	493	3002A
	503	3003A
	513	3004A
	523	3005A
	533	3006A
	543	3007A
	553	3008A
	563	3009A
	573	30000A
	583	30001A
	593	30002A
	603	30003A
	613	30004A
	623	30005A
	633	30006A
	643	30007A
	653	30008A
	663	30009A
	673	300000A
	683	300001A
	693	300002A
	703	300003A
	713	300004A
	723	300005A
	733	300006A
	743	300007A
	753	300008A
	763	300009A
	773	3000000A
	783	3000001A
	793	3000002A
	803	3000003A
	813	3000004A
	823	3000005A
	833	3000006A
	843	3000007A
	853	3000008A
	863	3000009A
	873	30000000A
	883	30000001A
	893	30000002A
	903	30000003A
	913	30000004A
	923	30000005A
	933	30000006A
	943	30000007A
	953	30000008A
	963	30000009A
	973	300000000A
	983	300000001A
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	000	3000000000000009A
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	000	30000000000000000000007A
	000	30000000000000000000008A
	000	30000000000000000000009A
	000	300000000000000000000000A
	000	300000000000000000000001A
	000	300000000000000000000002A
	000	300000000000000000000003A
</		

AMODS

LABEL	OPCODE	OPERAND	CT ADDRS	INSTRUCTION
MESS1	DCW	a SPACE 1 AFTER PRINTA.G	20	07082
MESS3		a SPACE 2 AFTER PRINTA.G	20	07103
MESS4		a SPACE 3 AFTER PRINTA.G	20	07124
MESS5		a SPACE 1 IMMEDIATE a.G	20	07145
MESS6		a SPACE 2 IMMEDIATE a.G	20	07166
MESS7		a SPACE 3 IMMEDIATE a.G	20	07187
MESS8		a SKIP TO CHANNEL IMMEDIATE a.G	31	07208
MESS9		a TEST BRANCH ON CHANNEL 9,1403 a.G	31	07240
MESS10		a TEST BRANCH ON CHANNEL 12,1403a.G	31	07272
MESS11		a SKIP TO CHANNEL AFTER PRINTA.G	31	07304
MESS12		a TEST HIGH SPEED SKIP 2 TO 12 a.G	31	07336
MESS13		a HIGH SPEED SKIP O.K. a.G	31	07368
MESS14		a SPACE SUPPRESS PRINTER ERROR a.G	31	07400
MESS15		a SPACE SUPPRESS PRINTER XXXXX a.G	31	07432
MESS2		a 00000 1 00000 00000a.G	20	07464
		a 00000 2 0000000000a.G	20	07504
		a 00000 3 00000000000a.G	20	07525
		a 1111 1 111111111a.G	20	07546
		a 1111 2 111111111a.G	20	07567
		a 1111 3 1111111111a.G	20	07588
		a 2222 22 22222222 2222222222 a.G	31	07620
		a 7777 777777 77 77777777 9,77777 a.G	31	07652
		a 8888 888888 88 88888888 12,88888a.G	31	07684
		a 3333 33 33333333 33333333333a.G	31	07716
		a ---- ----- 2 -- 12 a.G	31	07748
		a 0000 0000 0000 n.n. a.G	31	07780
		a //////////////// //////////////// a.G	31	07812
		a //////////////// //////////////// \$\$\$\$ a.G	31	07844
	ORG	9700		09700
	DA	1X132.G		09700
	ORG	9600		09600
	PST			J02000
	END	2000		5 09604
			ORER	2 09606
			615	1 09607
			61	1 09608
			66	

SUMMARY**TITLE****W002 1403 Forms Control Test****PURPOSE**

To test all possible forms control operations associated with a printed line such that a visual check for correctness can be made.

LOADING PROCEDURES

See Loading Procedures.

SYSTEM AND CHANNEL CONTROL CARDS

This program must have the system and channel configuration punched correctly. (See instruction in INTRODUCTORY MATERIAL.)

TADS

Do not enter any TADs for normal operation. Normally set OFF (1).

STANDARD TADS

<u>TAD</u>	<u>Location</u>				
TAD 0	01000	OFF	1	Typeout	
		ON	1	Bypass typeouts	
TAD 1	01001	OFF	1	Proceed to next routine	
		ON	1	Repeat the routine	
TAD 2	01002	OFF	1	Bypass error halts	
		ON	1	Halt on error	
TAD 3	01003	OFF	1	One pass of program	
		ON	1	Repeat program	

NO SPECIAL TADS ARE USED

UNITS TESTED

1403 Printer

SEE PROGRAM WRITE-UP FOR DETAILS.

